Project	**IEEE 802.20 Working Group on Mobile Broadband Wireless Access**
Title	**Proposed Text for 802.20 PICS Proforma – Wideband Mode**
Date Submitted	**2008-09-08**
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Re:	IEEE 802.20 PICS Proforma Support – Wideband Mode
Abstract	This contribution proposes a draft PICS Proforma for IEEE 802.20 Wideband Mode. The version herein is enhanced with more detail for the Physical Layer features, as requested during the July and September meetings.
Purpose	For consideration and approval of 802.20.
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Abstract: This standard represents the Protocol Implementation Conformance Statement Proforma, per ISO/IEC 9646-7 and ITU-T X.296, for conformance specification of access nodes and access terminals based on the air interface specified in IEEE Std 802.20

Conformance to IEEE 802.20 Protocol Implementation Conformance Statement (PICS) Proforma

1. Overview

To evaluate conformance of a particular implementation, it is necessary to have a statement of which capabilities and options have been implemented for a telecommunications specification. Such a statement is called a protocol Implementation Conformance Statement (ICS).

1.1 Scope

This standard represents the Protocol Implementation Conformance Statement (PICS) Proforma, per ISO/IEC 9646-7[1] and ITU-T X.296, for conformance specification of base stations and subscriber stations based on the air interface specified in IEEE Std 802.20.

1.2 Purpose

This document describes the capabilities and options within the air interface specified in IEEE Std 802.20. It is to be completed by the supplier of a product claiming to implement the protocol. It indicates which capabilities and options have been implemented. It allows a user of the product to evaluate its conformance and to determine whether the product meets the user's requirements.

2. Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies. The following documents contain provisions which, through reference in this text, constitute provisions of the present document. References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific. For a specific reference, subsequent revisions do not apply. For a non-specific reference, the latest version applies.

IEEE Std 802.20, Mobile Broadband Wireless Access— Air Interface Specification

ISO/IEC 9646-1, Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 1: General concepts.[3]

ISO/IEC 9646-7, Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 7: Implementation Conformance Statements.

ETSI TS 102 385-1, Broadband Radio Access Networks (BRAN); HiperMAN/WiMAX; Conformance

testing for the Data Link Control Layer (DLC); Part 1: Protocol Implementation Conformance Statement (PICS) proforma.4

3. Definitions and abbreviations

3.1 Definitions

This standard uses terms defined in IEEE Std 802.20, ISO/IEC 9646-1, ISO/IEC 9646-7, and ETSI TS 102 385-1. *The Authoritative Dictionary of IEEE Standards Terms*, Seventh Edition, should be referenced for terms not defined in this clause.
In particular, the following terms and definitions defined in ISO/IEC 9464-1 apply:
Implementation Conformance Statement (ICS): Statement made by the supplier of an implementation or system claimed to conform to a given specification, stating which capabilities have been implemented. The ICS can take several forms: protocol ICS, profile ICS, profile specific ICS, information object ICS, etc.

ICS proforma: Document, in the form of a questionnaire, which when completed for an implementation or system becomes an ICS.

Protocol ICS (PICS): ICS for an implementation or system claimed to conform to a given protocol specification.

3.2 Abbreviations

This standard uses terms defined in IEEE Std 802.16-2004. In addition, the following abbreviations apply:

ATS abstract test suite
ICS Implementation Conformance Statement
IUT Implementation Under Test
PICS Protocol Implementation Conformance Statement
RCT radio conformance test
SUT System Under Test
TP test purpose
TSS test suite structure

4. Conformance to this PICS proforma specification

If it claims to conform to this standard, the actual PICS proforma to be filled in by a supplier shall be technically equivalent to the text of the PICS proforma given in Annex A and shall preserve the numbering, naming, and ordering of the proforma items.
A PICS that conforms to this standard shall be a conforming PICS proforma completed in accordance with the guidance for completion given in A.1.

Annex A

(normative)

PICS proforma for 802.20 compliant systems

A.1 Guidance for completing PICS proforma[5]

A.1.1 Purposes and structure

The purpose of this PICS proforma is to provide a mechanism whereby a supplier of an implementation of the requirements for mobile broadband wireless networks defined in IEEE Std 802.20 may provide information about the implementation in a standardized manner.

The PICS proforma is subdivided into subclauses for the following categories of information:

— Guidance for completing the PICS proforma
— Identification of the implementation
— Identification of the standard
— Global statement of conformance
— Roles
— Access Node and Access Terminal in the wideband mode
— Base Station and User Terminal in the 625K mode

A.1.2 Abbreviations and conventions

Item column

The Item column contains a number that identifies the item in the table.

Capability column

The capability column describes in free text each respective item (e.g., parameters and timers). It implicitly means “Is <capability> supported by the implementation?”.

Reference column

The reference column indicates the section(s) of IEEE Std 802.20 from which the requirement for the capability is derived.

Status column

The following notations, defined in ISO/IEC 9646-7, are used in the status column:

m	Mandatory — the capability is required to be supported
o	Optional — the capability may be supported or not
n/a	Not applicable — in the given context, it is impossible to use the capability
x	Prohibited (excluded) — there is a requirement not to use this capability in the given context
o.i	Qualified option — for mutually exclusive or selectable options from a set. “i” is an integer that identifies a group of related optional items and the logic of their selection which is defined immediately following the table
ci	Conditional — the requirement on the capability (“m”, “o”, “x”, or “n/a”) depends on the support of other optional or conditional items. “i” is an integer identifying a conditional status expression that is defined immediately following the table.
i	Irrelevant (out of scope) — capability outside the scope of

	the reference specification. No answer is requested from the supplier.

Support column

The support column shall be filled in by the supplier of the implementation. The following common notations, defined in ISO/IEC 9646-7, are used for the support column:

Y or y	Supported by implementation.
N or n	Not supported by implementation.
N/A, n/a or -	No answer required (allowed only if the status is n/a either directly or after the evaluation of a conditional status).

Values column

The values column is only used when necessary in a table. It contains the type, the list, the range, or the length of values. The following notations are used:

Range of values: Example:	<min value>..<max value> 5..20
List of values: Example 1: Example 2: Example 3:	<value1>, <value2>, …, <valueN> 2, 4, 6, 8, 9 1101b, 1011b, 1111b 0x0A, 0x34, 0x2F
List of named values: Example:	<name1>(<val1>), <name2>(<val2>), …, <nameN>(<valN>) reject(1), accept(2)
Length: Example:	Size (<min size>..<max size>) Size (1..8)

Values supported column

The values supported column is only present when the values column is present. It shall be filled in by the supplier of the implementation. In this column, the value or the ranges of values supported by the implementation shall be indicated.

Reference to items

For each possible item answer in the support column within the PICS proforma a unique reference exists that may be used, for example, in conditional expressions. It is defined as the table identifier, followed by the "/" character, followed by the item number in the table. If there is more than one support column in a table, the columns are discriminated by letters (a, b, etc.).

Example:	A.5/4 is the reference to the answer of item 4 in Table A.5.
Example:	A.6/3b is the reference to the second answer (i.e., in the second support column) of item 3 in Table A.6.

Prerequisite line

A prerequisite line takes the following form:

Prerequisite: <predicate>

A prerequisite line after a clause or table title indicates that the entire clause or the entire table is not required to be completed if the predicate is FALSE.

A.1.3 Instructions for completing the PICS proforma

The supplier of the implementation shall complete the PICS proforma in each of the spaces provided. In particular, an explicit answer shall be entered, in the support or values supported column boxes provided, using the notation described in A.1.2.

However, tables specific for access nodes (AN) shall only be completed for AN implementations, and tables specific to access terminals (AT) shall only be completed for AT implementations.
If necessary, the supplier may provide additional comments in the space at the bottom of the tables or separately.

A.2 Identification of the implementation

Identification of the Implementation Under Test (IUT) and the system in which it resides [the System Under
Test (SUT)] should be filled in to provide as much detail as possible regarding version numbers and configuration options.
The product supplier and client information should both be filled in if they are different.
A person who can answer queries regarding information supplied in the PICS should be named as the contact person.

A.2.1 Date of statement

Date of Statement:

A.2.2 Implementation Under Test (IUT) identification

IUT name:
IUT version:

A.2.3 System Under Test (SUT) identification

SUT name:
Hardware configuration:
Operating system:

A.2.4 Product supplier

Name:
Address:
Telephone number:
Facsimile number:
E-mail address:
Additional information:

A.2.5 Client (if different from product supplier)

Name:
Address:

Telephone number:
Facsimile number:
E-mail address:
Additional information:

A.2.6 PICS contact person

(A person to contact if there are any queries concerning the content of the PICS.)

Name:
Telephone number:
Facsimile number:
E-mail address:
Additional information:

A.3 Identification of the standard

This PICS proforma applies to IEEE Std 802.20

A.4 Global statement of conformance

Are all mandatory capabilities implemented? (Yes/No)

NOTE—Answering "No" to this question indicates non-conformance to IEEE Std 802.20. Non-supported mandatory capabilities are to be identified in the PICS, with an explanation of why the implementation is nonconforming, on pages attached to the PICS proforma.

A.5 Profiles

Profiles	Reference	Status	Support
Wideband Mode	5.4	o.1	
625k-MC Mode	5.5	o.1	

o.1: It is mandatory to support at least one of these items.

A.5.1 Roles

Item	Role	Reference	Status	Support
1	Access Node (AN)		o.2	
2	Access Terminal (AT)		o.2	

o.2: It is mandatory to support at least one of these items.

A.5.2 PICS for AN in Wideband Mode

A.5.2.1 Duplexing Mode

Item	Name	Reference	Status	Support
1	TDD	5.4	o.3	
2	FDD	5.5	o.3	

o.3: It is mandatory to support at least one of these items.

A.5.2.2 Services Sublayer

Item	Name	Reference	Status	Support
1	Signaling protocol	6.2	m	
2	Inter-route tunneling protocol	6.3	m	
3	ROHC support protocol	6.4	m	
4	EAP support protocol	6.5	m	

A.5.2.3 RadioLink Sublayer

Item	Name	Reference	Status	Support
1	QOS Management protocol	7.2	m	
2	Radio Link protocol	7.3	m	
3	Stream protocol	7.4	m	
4	Route protocol	7.5	m	

A.5.2.4 Lower MAC Sublayer

Item	Name	Reference	Status	Support
1	Packet Consolidation protocol	8.2	m	
2	Superframe Preamble MAC protocol	8.3	m	
3	Access Channel MAC protocol	8.4	m	
4	FLCS MAC protocol	8.5	m	
5	FTC MAC protocol	8.6	m	
6	RCC MAC protocol	8.7	m	
7	RTC MAC protocol	8.8	m	

A.5.2.5 Physical Layer Protocol

Item	Name	Reference	Status	Support

1	Physical Layer Protocol	9.1	m	

A.5.2.5.1 FFT Size

Item	Name	Reference	Status	Support
1	FFT Size = 512	9.2.7.1.2	o.8	
2	FFT Size = 1024	9.2.7.1.2	o.8	
3	FFT Size = 2048	9.2.7.1.2	o.8	

o.8: It is mandatory to support at least one of these items.

A.5.2.5.2 Duplexing Mode

Item	Name	Reference	Status	Support
1	FDD	9.2.2.4	o.4	
2	TDD44	9.2.2.4	o.4	
3	TDD63	9.2.2.4	o.4	

o.4: It is mandatory to support at least one of these items.

A.5.2.5.2.1 Half Duplexing within FDD

Item	Name	Reference	Status	Support
1	Half Duplex Mode	9.2.2.4	o.7	

o.7: This is an optional feature if FDD is chosen as o.4 in A5.2.5.2 as Duplexing Mode

A.5.2.5.3 Coding Schemes

Item	Name	Reference	Status	Support
1	Rate 1/3 Convolutional Encoding	9.2.6.3.1	m	
2	Rate 1/3 Concatenated Encoding	9.2.6.3.2	m	
4	Rate 1/5 Turbo Encoding	9.2.6.3.3	m	
5	Low Density Parity Check Encoding	9.2.6.3.4	o	

A.5.2.5.4 Transmission Features in the Physical Layer

Item	Name	Reference	Status	Support
1	Precoding – Knockdown Codebook	9.2.8.2.2.1	m	
2	Precoding –	9.2.8.2.2.2	m	

	Readymade Codebook			
3	Precoding – Downloadable Codebook	9.2.8.2.3	m	
4	Precoding – Random Orthonormal Ensemble	9.2.8.2.4	m	
5	Rotational OFDM	9.2.9	o	

A.5.2.6 Security Functions

Item	Name	Reference	Status	Support
1	AES Ciphering protocol	10.2	m	
2	Message Integrity protocol	10.3	m	
3	Key Exchange protocol	10.4	m	

A.5.2.7 Connection Control Sublayer

Item	Name	Reference	Status	Support
1	Air Link Management protocol	11.2	m	
2	Initialization State protocol	11.3	m	
3	Idle State protocol	11.4	m	
4	Connected State protocol	11.5	m	
5	Overhead Messages protocol	11.6	m	
6	Active Set Management protocol	11.7	m	

A.5.2.8 Session Control Plane

Item	Name	Reference	Status	Support
1	Session Control protocol	12.2	m	

A.5.2.9 Route Control Plane

Item	Name	Reference	Status	Support
1	Route Control protocol	13.2	m	

A.5.2.8 Broadcast Support

Broadcast Support is optional. If it is supported, we have:

Item	Name	Reference	Status	Support
1	Broadcast Control protocol	14.2.2	m	
2	Broadcast Packet Consolidation protocol	14.2.3	m	
3	Broadcast Security protocolm	14.2.4	m	
4	Broadcast Inter-Route Tunneling protocol	14.2.5	m	
5	Broadcast MAC protocol	14.2.6	m	

A.5.3 PICS for AT in Wideband Mode

A.5.3.1 Duplexing Mode

Item	Name	Reference	Status	Support
1	TDD	5.4	o.5	
2	FDD	5.5	o.5	

o.5: It is mandatory to support at least one of these items.

A.5.3.2 Services Sublayer

Item	Name	Reference	Status	Support
1	Signaling protocol	6.2	m	
2	Inter-route tunneling protocol	6.3	m	
3	ROHC support protocol	6.4	m	
4	EAP support protocol	6.5	m	

A.5.3.3 RadioLink Sublayer

Item	Name	Reference	Status	Support
1	QOS Management protocol	7.2	m	
2	Radio Link protocol	7.3	m	
3	Stream protocol	7.4	m	
4	Route protocol	7.5	m	

A.5.3.4 Lower MAC Sublayer

Item	Name	Reference	Status	Support
1	Packet Consolidation protocol	8.2	m	

2	Superframe Preamble MAC protocol	8.3	m	
3	Access Channel MAC protocol	8.4	m	
4	FLCS MAC protocol	8.5	m	
5	FTC MAC protocol	8.6	m	
6	RCC MAC protocol	8.7	m	
7	RTC MAC protocol	8.8	m	

A.5.3.5 Physical Layer Protocol

Item	Name	Reference	Status	Support
1	Physical Layer Protocol	9.1	m	

A.5.2.5.1 FFT Size

Item	Name	Reference	Status	Support
1	FFT Size = 512	9.2.7.1.2	o.9	
2	FFT Size = 1024	9.2.7.1.2	o.9	
3	FFT Size = 2048	9.2.7.1.2	o.9	

o.9: It is mandatory to support at least one of these items.

A.5.3.5.2 Duplexing Mode

Item	Name	Reference	Status	Support
1	FDD	9.2.2.4	o.6	
2	TDD44	9.2.2.4	o.6	
3	TDD63	9.2.2.4	o.6	

o.6: It is mandatory to support at least one of these items.

A.5.3.5.2.1 Half Duplexing within FDD

Item	Name	Reference	Status	Support
1	Half Duplex Mode	9.2.2.4	o.10	

o.10: This is an optional feature if FDD is chosen as o.6 in A5.3.5.2 as Duplexing Mode

A.5.3.5.3 Coding Schemes

Item	Name	Reference	Status	Support
1	Rate 1/3 Convolutional Encoding	9.2.6.3.1	m	
2	Rate 1/3 Concatenated Encoding	9.2.6.3.2	m	
4	Rate 1/5 Turbo Encoding	9.2.6.3.3	m	

5	Low Density Parity Check Encoding	9.2.6.3.4	o	

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2 ***A.5.3.5.4 Transmission Features in the Physical Layer***

Item	Name	Reference	Status	Support
1	Precoding – Knockdown Codebook	9.2.8.2.2.1	m	
2	Precoding – Readymade Codebook	9.2.8.2.2.2	m	
3	Precoding – Downloadable Codebook	9.2.8.2.3	m	
4	Precoding – Random Orthonormal Ensemble	9.2.8.2.4	m	
5	Rotational OFDM	9.2.9	o	

3

4 **A.5.3.6 Security Functions**

Item	Name	Reference	Status	Support
1	AES Ciphering protocol	10.2	m	
2	Message Integrity protocol	10.3	m	
3	Key Exchange protocol	10.4	m	

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6 **A.5.3.7 Connection Control Sublayer**

Item	Name	Reference	Status	Support
1	Air Link Management protocol	11.2	m	
2	Initialization State protocol	11.3	m	
3	Idle State protocol	11.4	m	
4	Connected State protocol	11.5	m	
5	Overhead Messages protocol	11.6	m	
6	Active Set Management protocol	11.7	m	

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8 **A.5.3.8 Session Control Plane**

Item	Name	Reference	Status	Support
1	Session Control	12.2	m	

	protocol			

A.5.3.9 Route Control Plane

Item	Name	Reference	Status	Support
1	Route Control protocol	13.2	m	

A.5.3.8 Broadcast Support

Broadcast Support is optional. If it is supported, we have:

Item	Name	Reference	Status	Support
1	Broadcast Control protocol	14.2.2	m	
2	Broadcast Packet Consolidation protocol	14.2.3	m	
3	Broadcast Security protocolm	14.2.4	m	
4	Broadcast Inter-Route Tunneling protocol	14.2.5	m	
5	Broadcast MAC protocol	14.2.6	m	